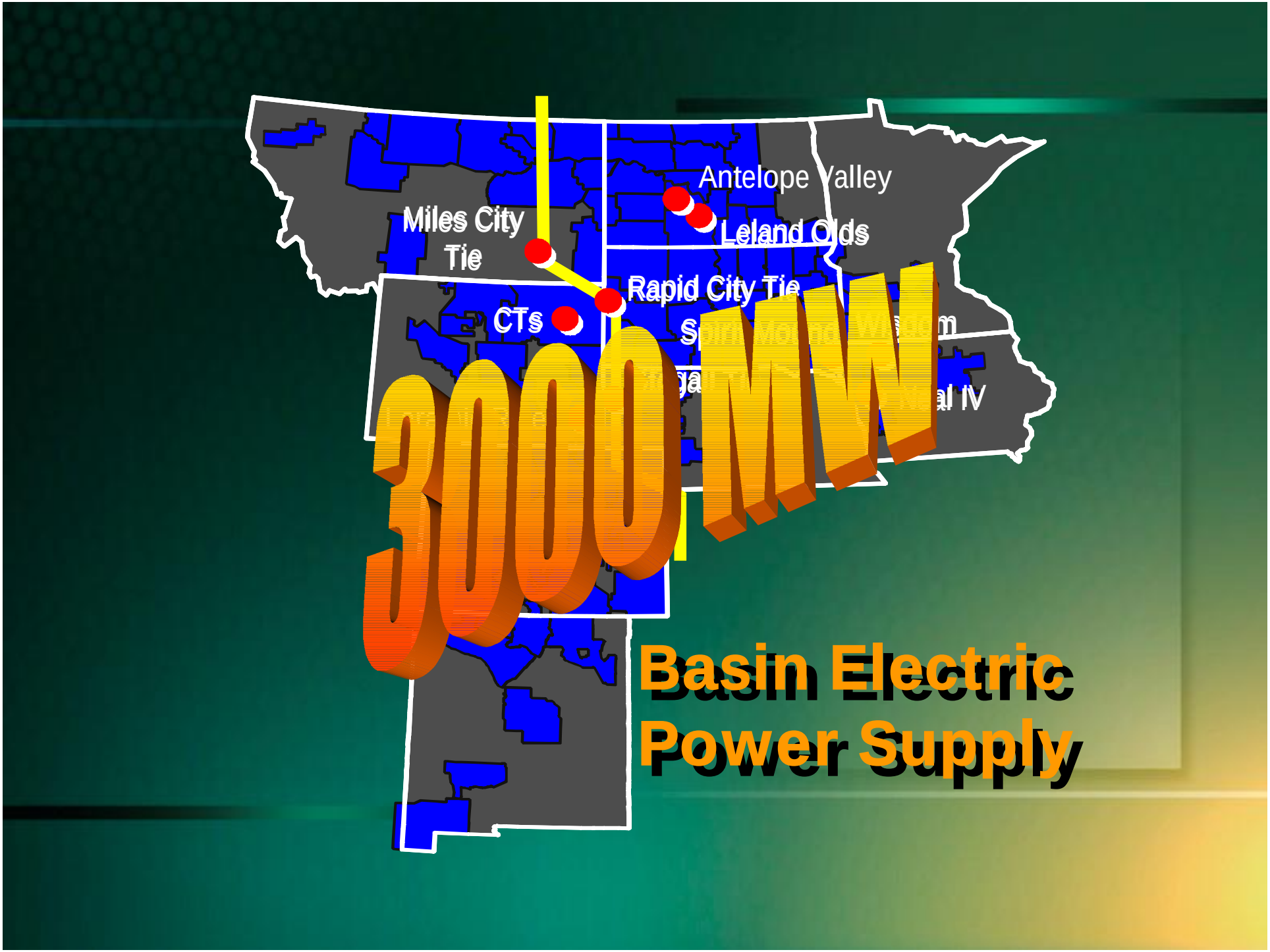
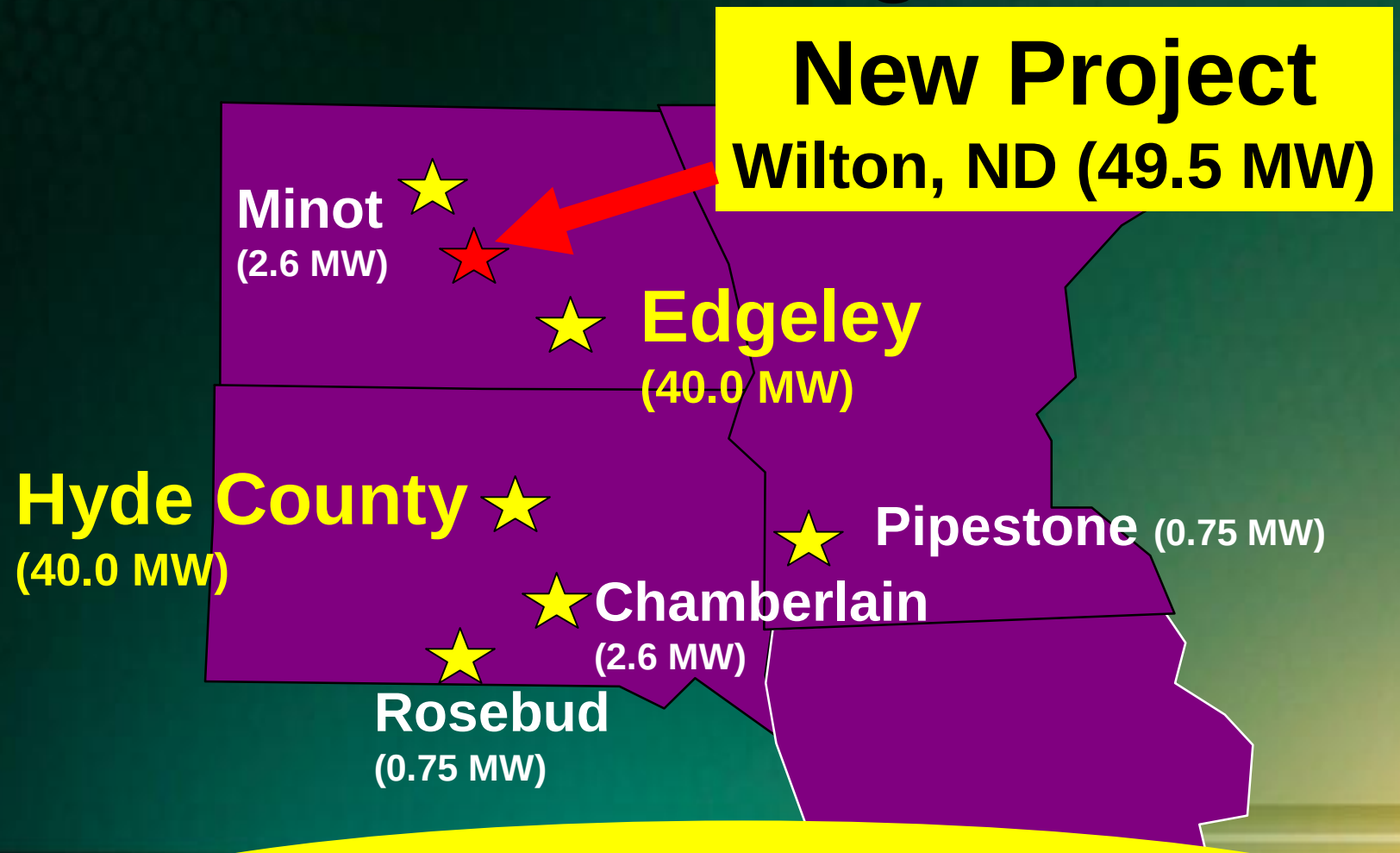

BASIN ELECTRIC
POWER COOPERATIVE
Your Touchstone Energy® Partner
Montana Energy Symposium
Wind Energy
October 19th, 2005
Ron Rebenitsch, PE


121 Member Co-ops:
Serving 1.8 Million
Consumers
ic Power Cooperative
MEMBER SYSTEMS

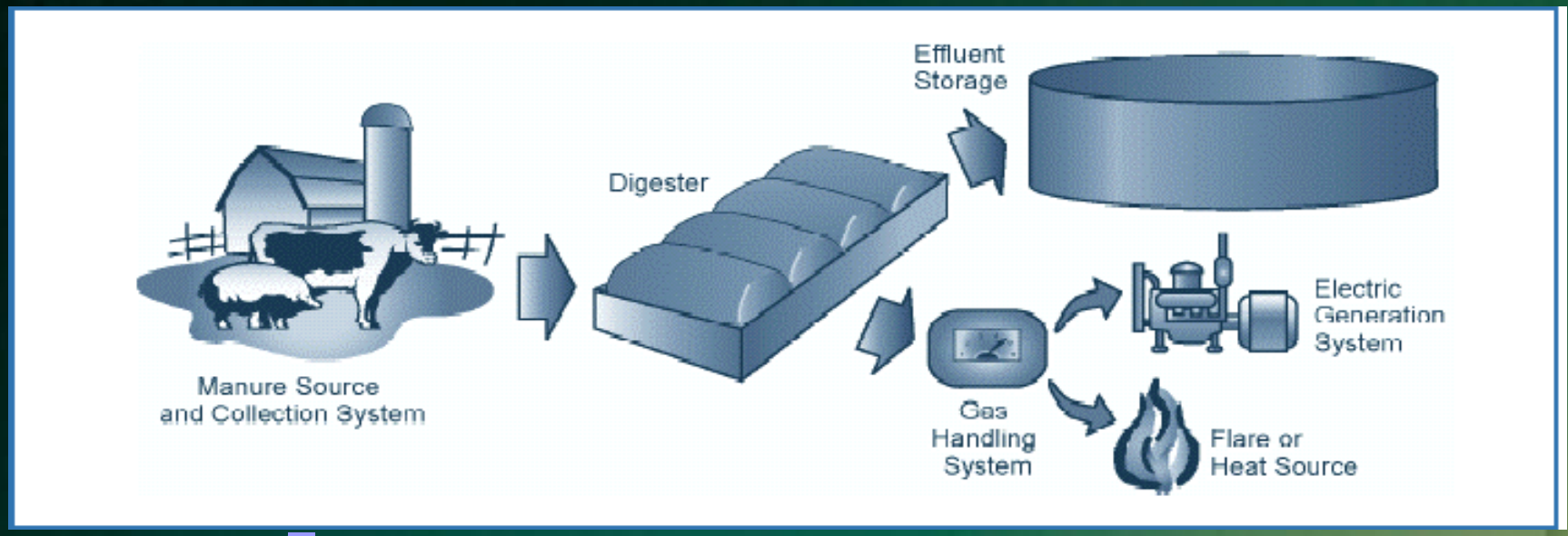

Antelope Valley
Miles City
Tie
Leland Olds
Rapid City Tie
CTs
3000 MW
Basin Electric
Power Supply

87 MW of Existing Wind…



New Total: 136.5 MW of Wind

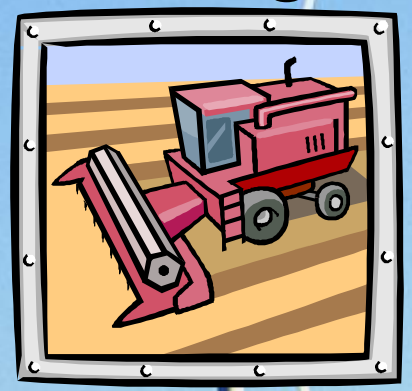
We're also looking at other non-standard resources…

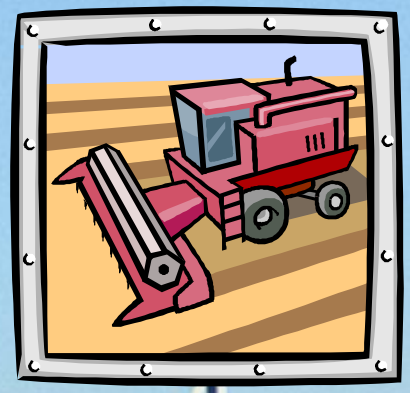


Methane Digester

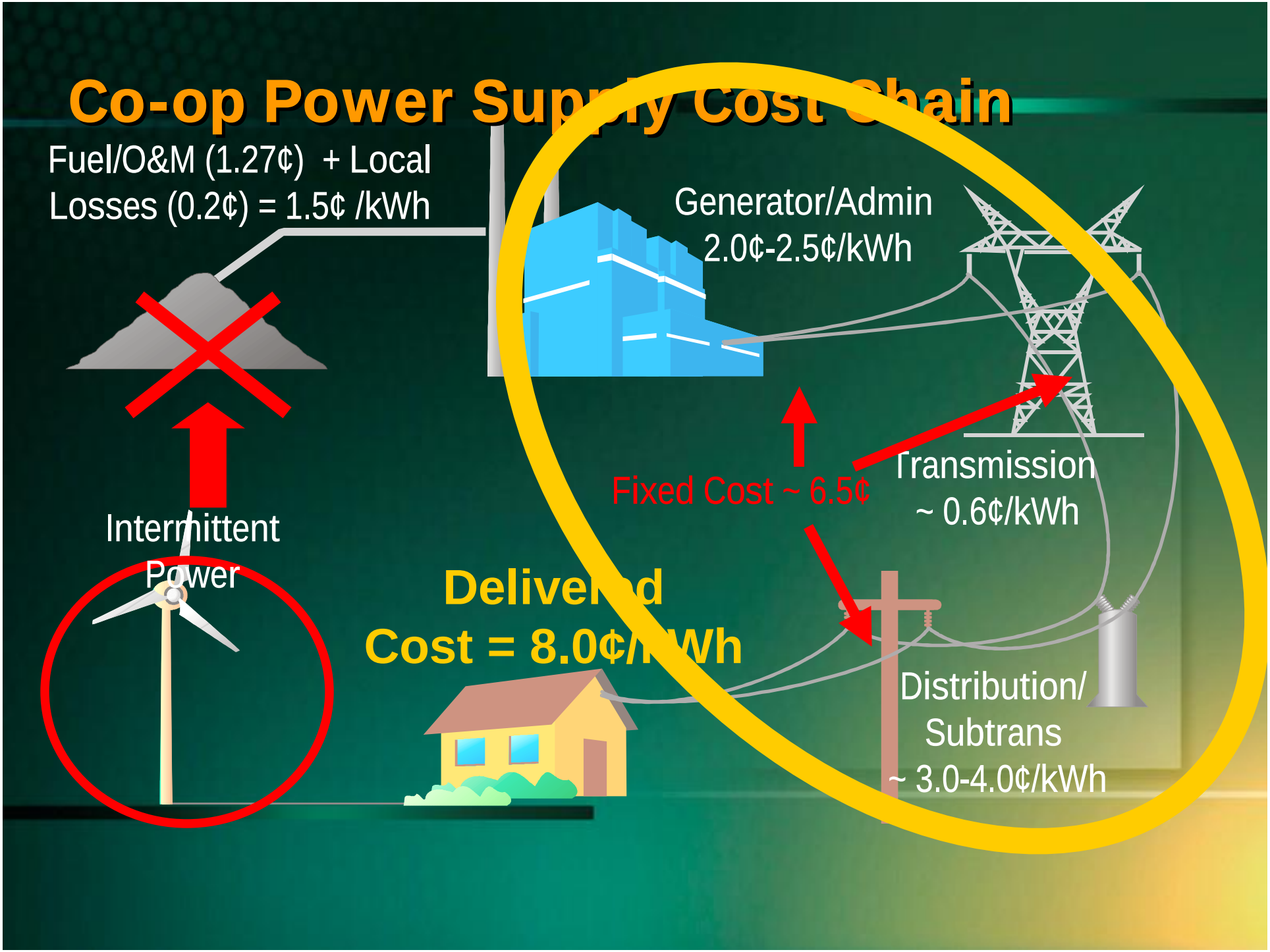
Waste Heat Recovery

Harvesting the wind is feasible, but…

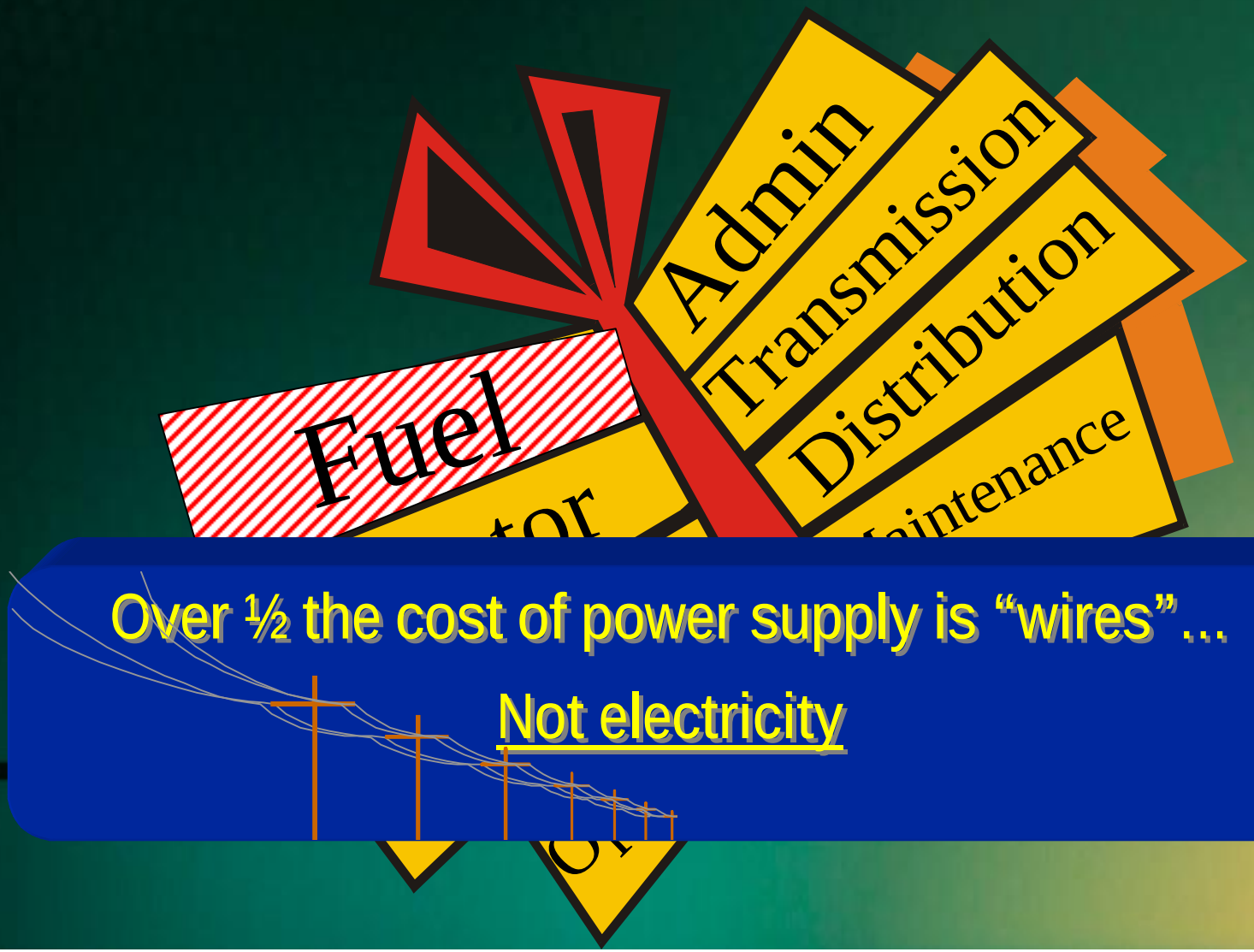




Economics drives decisions!


Co-op Power Supply Cost Chain
Fuel/O&M (1.27¢) + Local Losses (0.2¢) = 1.5¢ /kWh
Generator/Admin 2.0¢-2.5¢/kWh
Fixed Cost ~ 6.5¢
Transmission ~ 0.6¢/kWh
Intermittent Power
Delivered Cost = 8.0¢/kWh
Distribution/ Subtrans ~ 3.0-4.0¢/kWh

Net Metering shouldn't get "Bundled" Rate



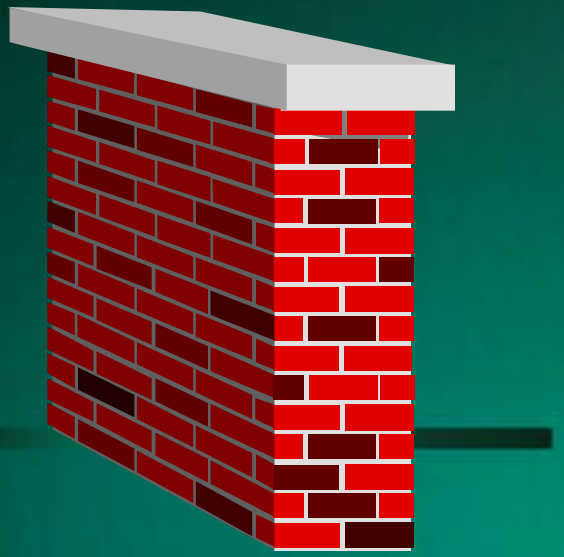
Over ½ the cost of power supply is "wires"…

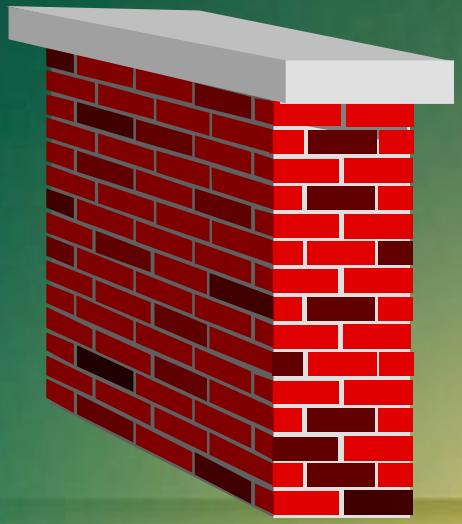
Not electricity

Wind faces two major hurdles....

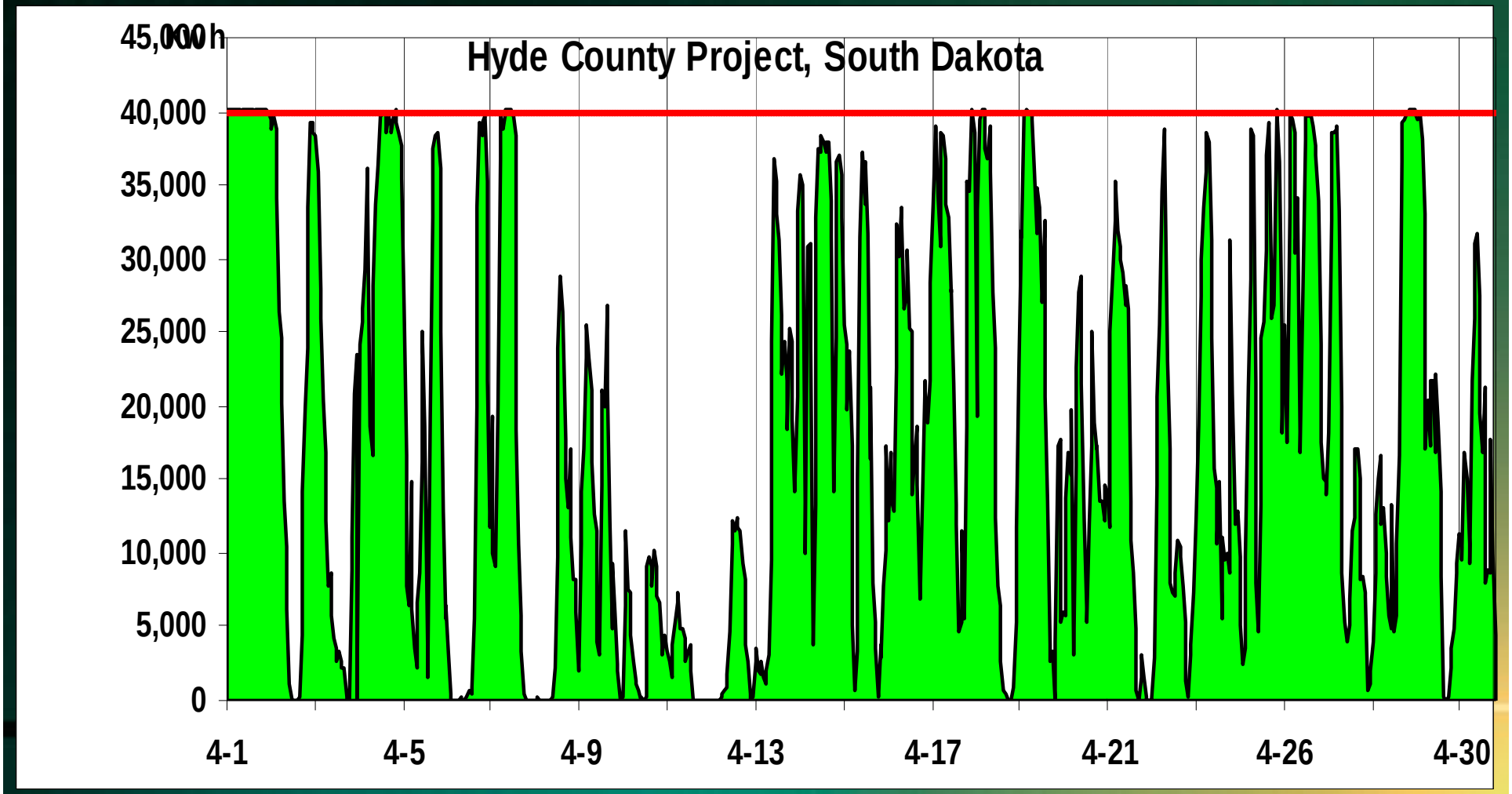
Intermittency

Transmission





Intermittency requires other power supply generation resources



Wind is non-dispatchable.
Its primary value is based on….

Fuel Displacement

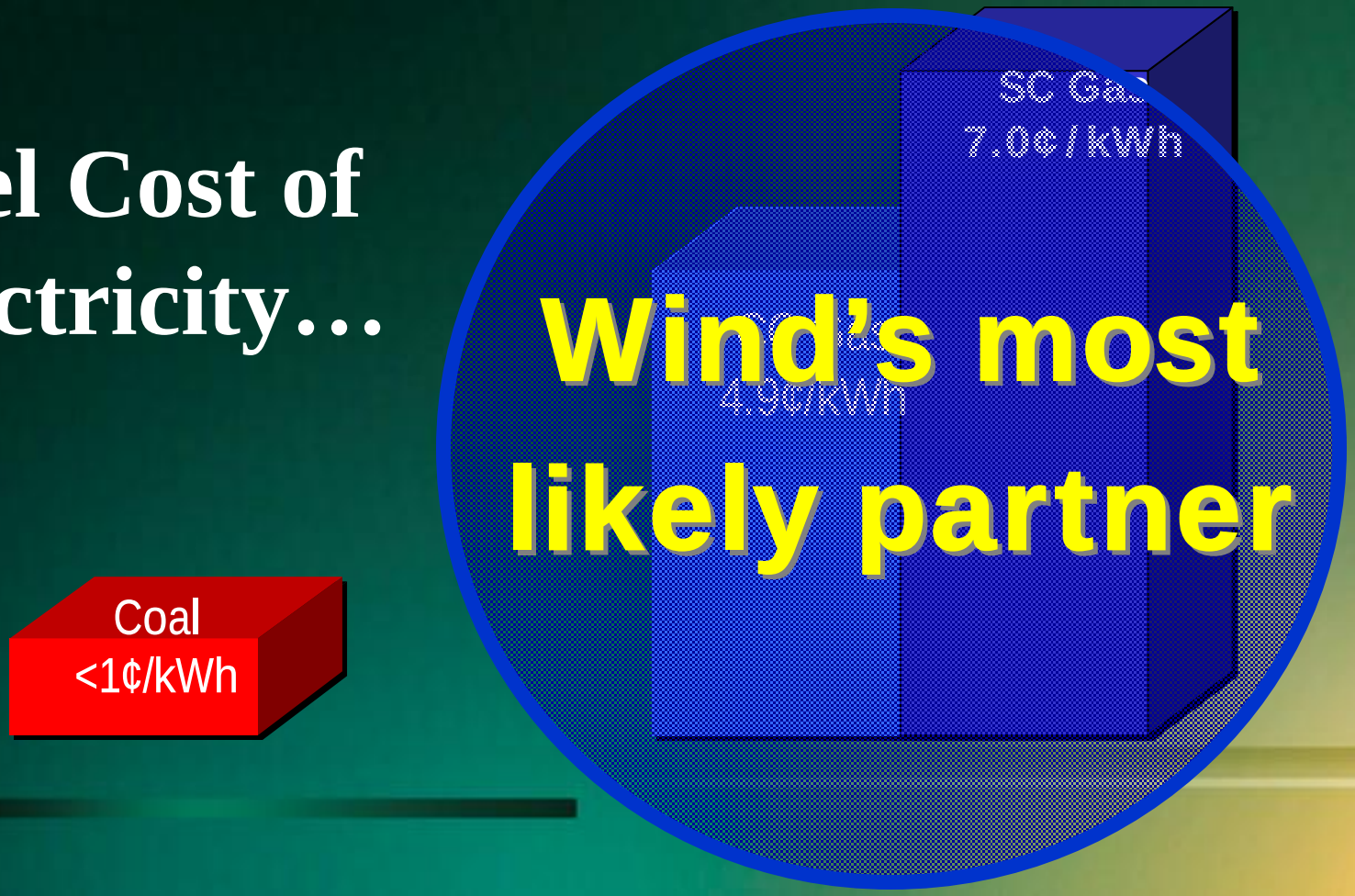
What Kind of Fuel Is Wind Displacing???

Coal: $10.00/Ton (~$0.60/mmbtu)

Gas: $7.00/mmbtu

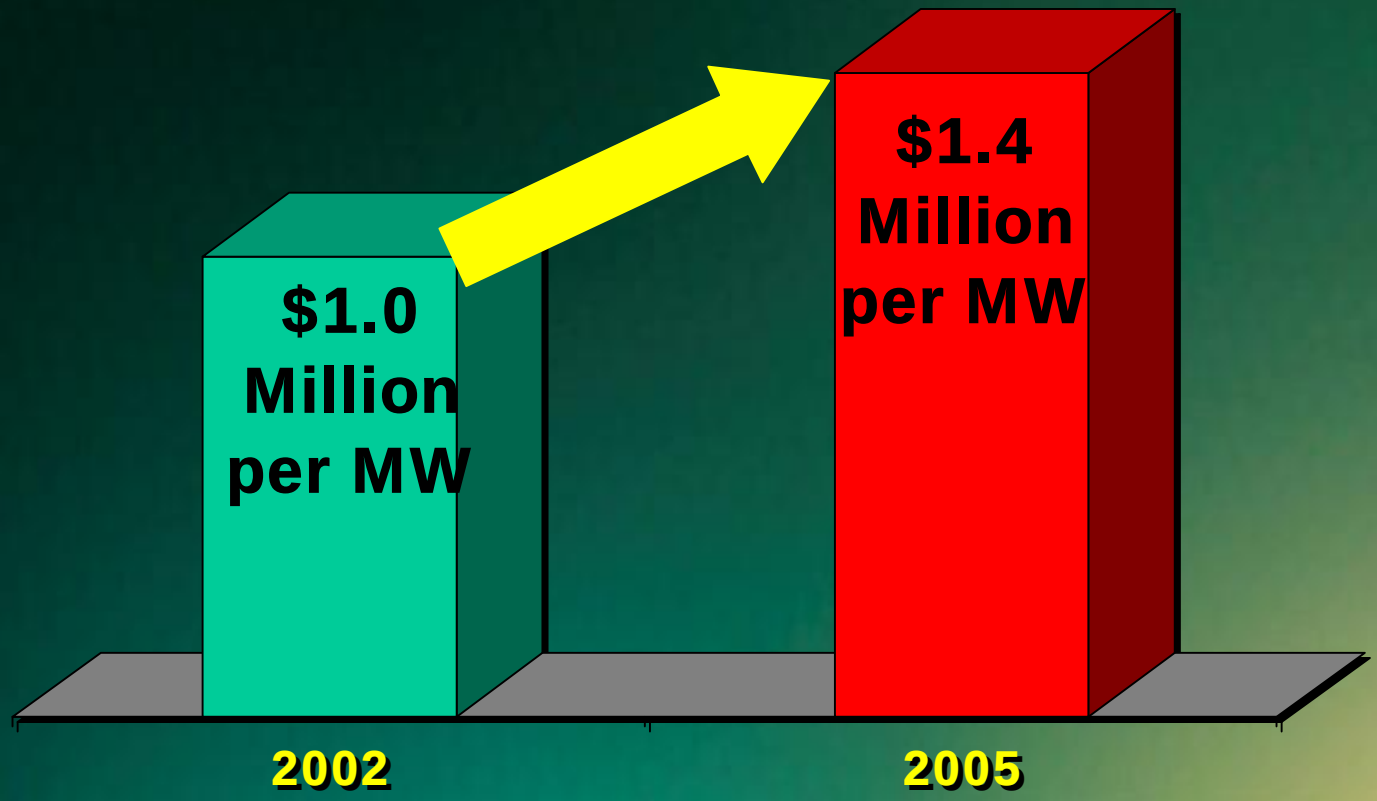
Economically, wind will displace the highest cost fuel

Fuel Cost of Electricity…



Wind's most likely partner

Recent Price Trends:
Wind project costs are up 30-40%



For Large Projects…

Developers are projecting prices near 2.5-3.0¢/kWh

(After Tax Credits)

How do we get to 2.5¢/kWh?

Two Major Factors…

Tax Incentives

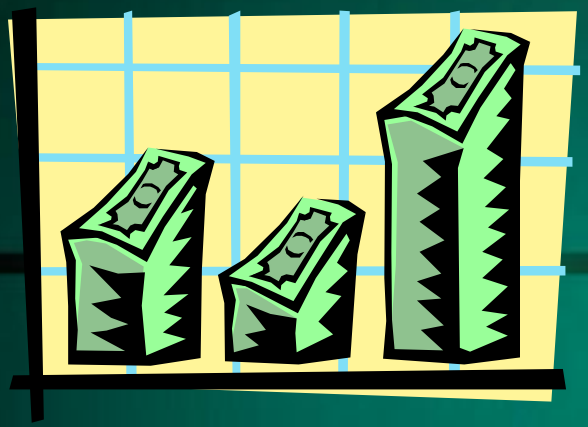
Economy of Scale

Taxes are main driver for Wind

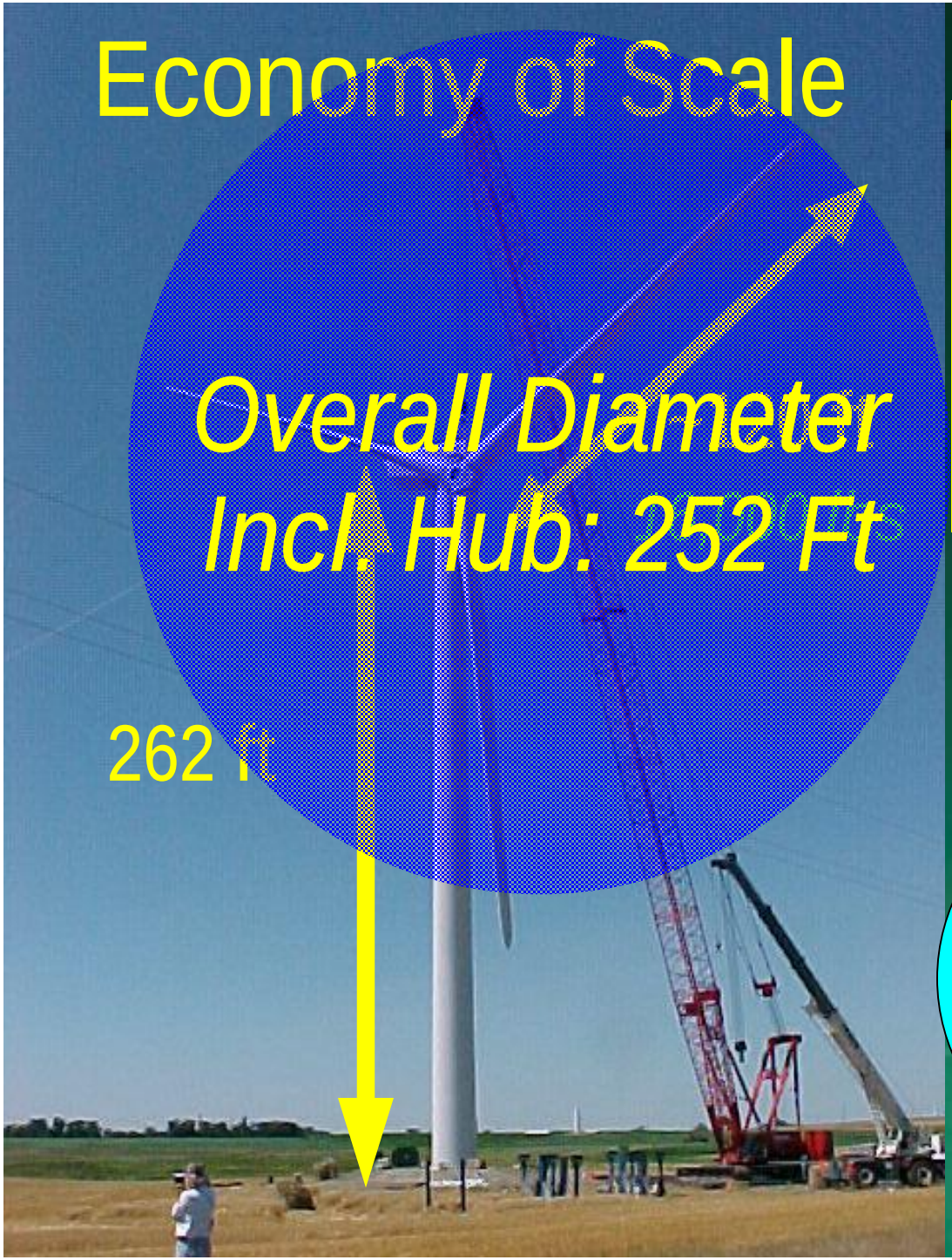
Over 1/2 of a Wind Project's cash flow is tax-related

Prod Tax Credit
$50,000/MW
Each Year

5 yr Accelerated
Depr. ~ $700,000/MW
(First 18 Months)



The developer needs a large "tax appetite"

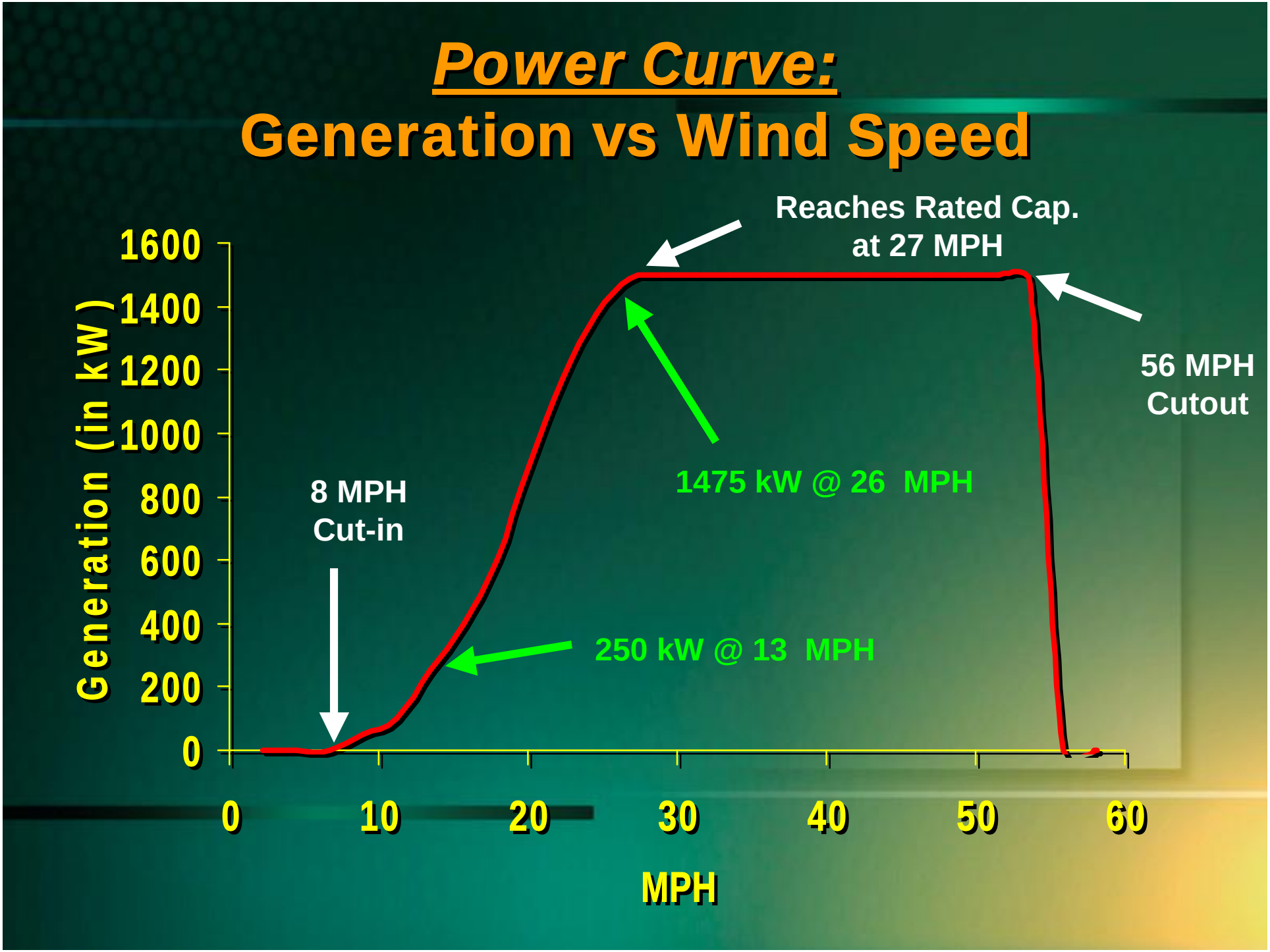


Rotates at 19-22 RPM

Project Size Target

50 to 100 MW

Power Curve:
Generation vs Wind Speed

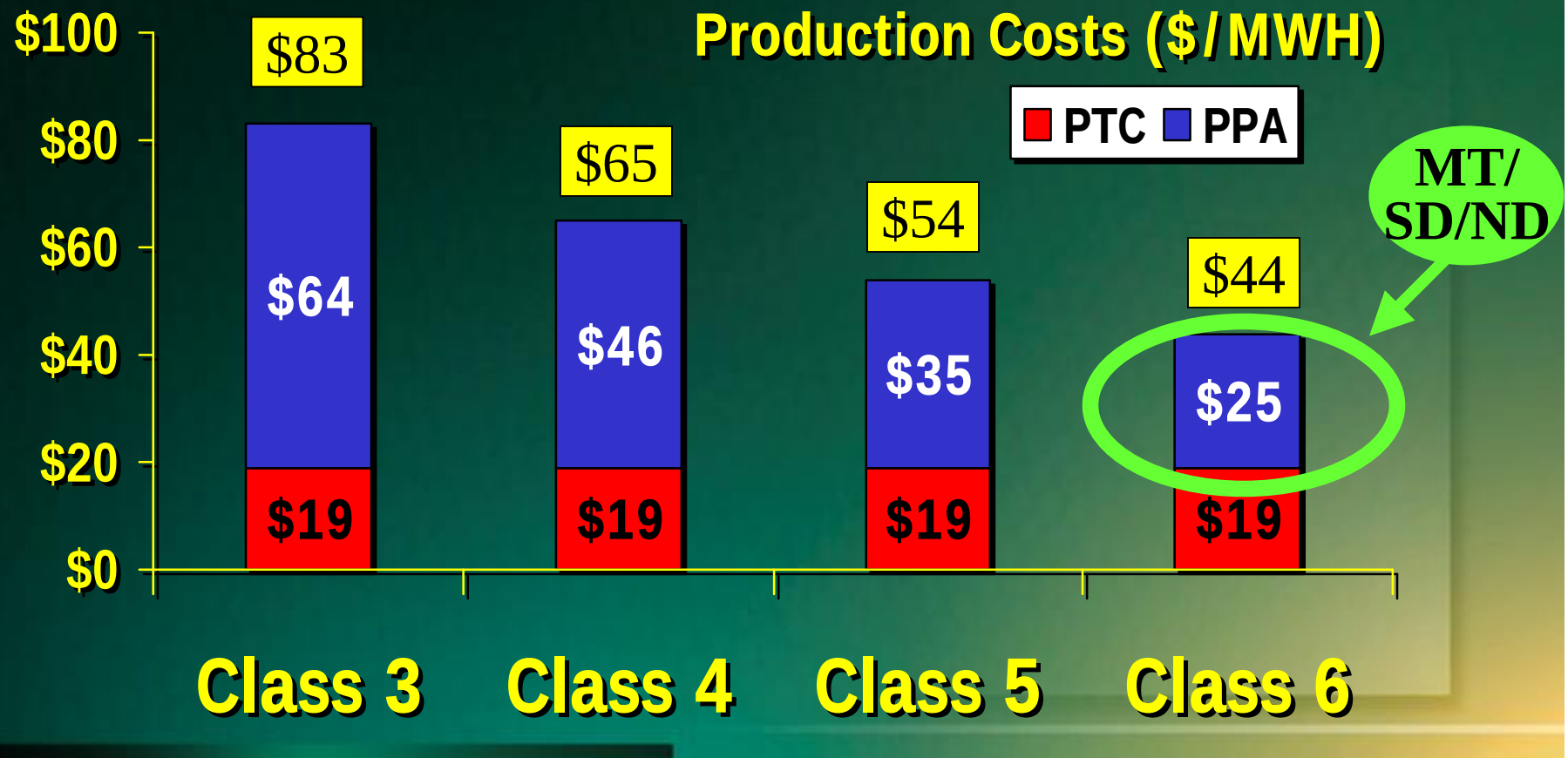


Wind Energy:

Generation increases with the cube of wind speed

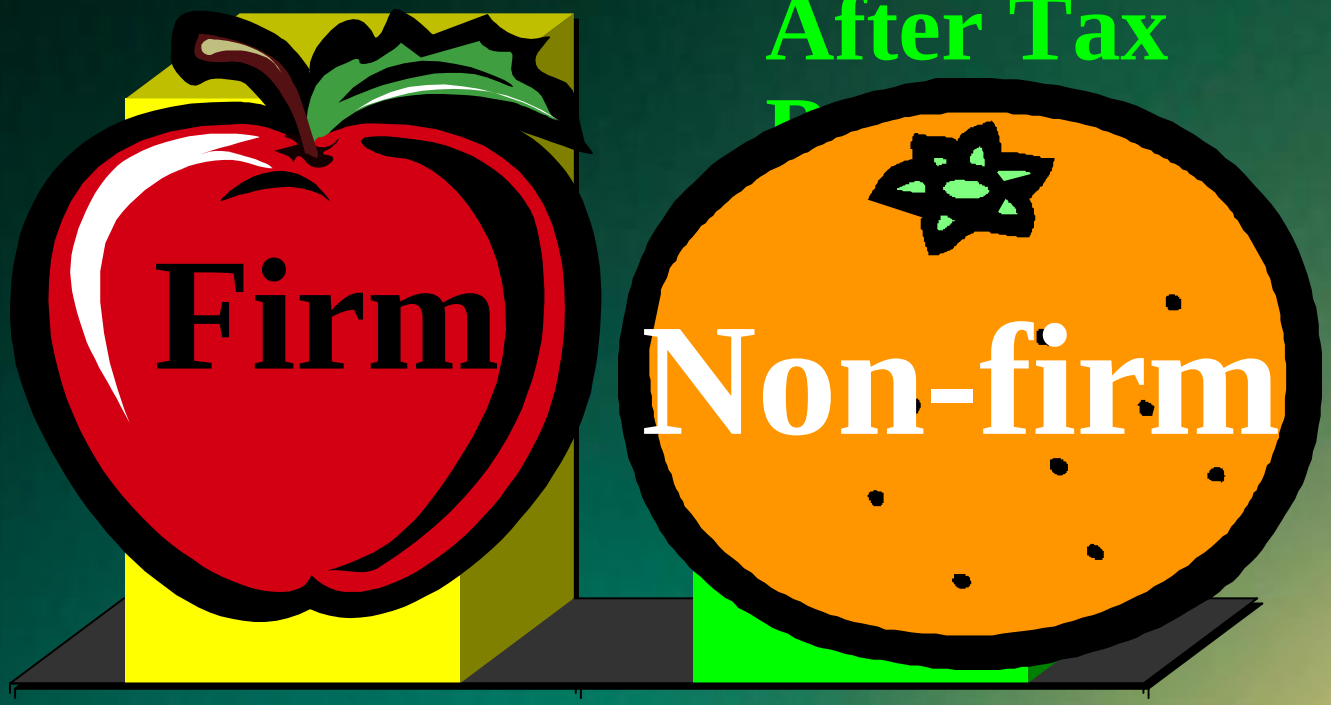
A 15% increase in wind speed yields a 50% increase in production

This means we have a competitive advantage!



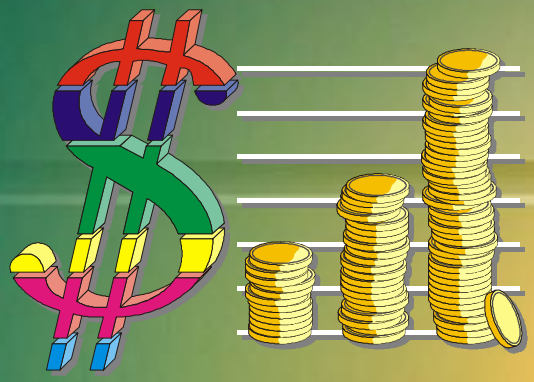
For New Generation…

Is Wind cheaper than fossil fuels??



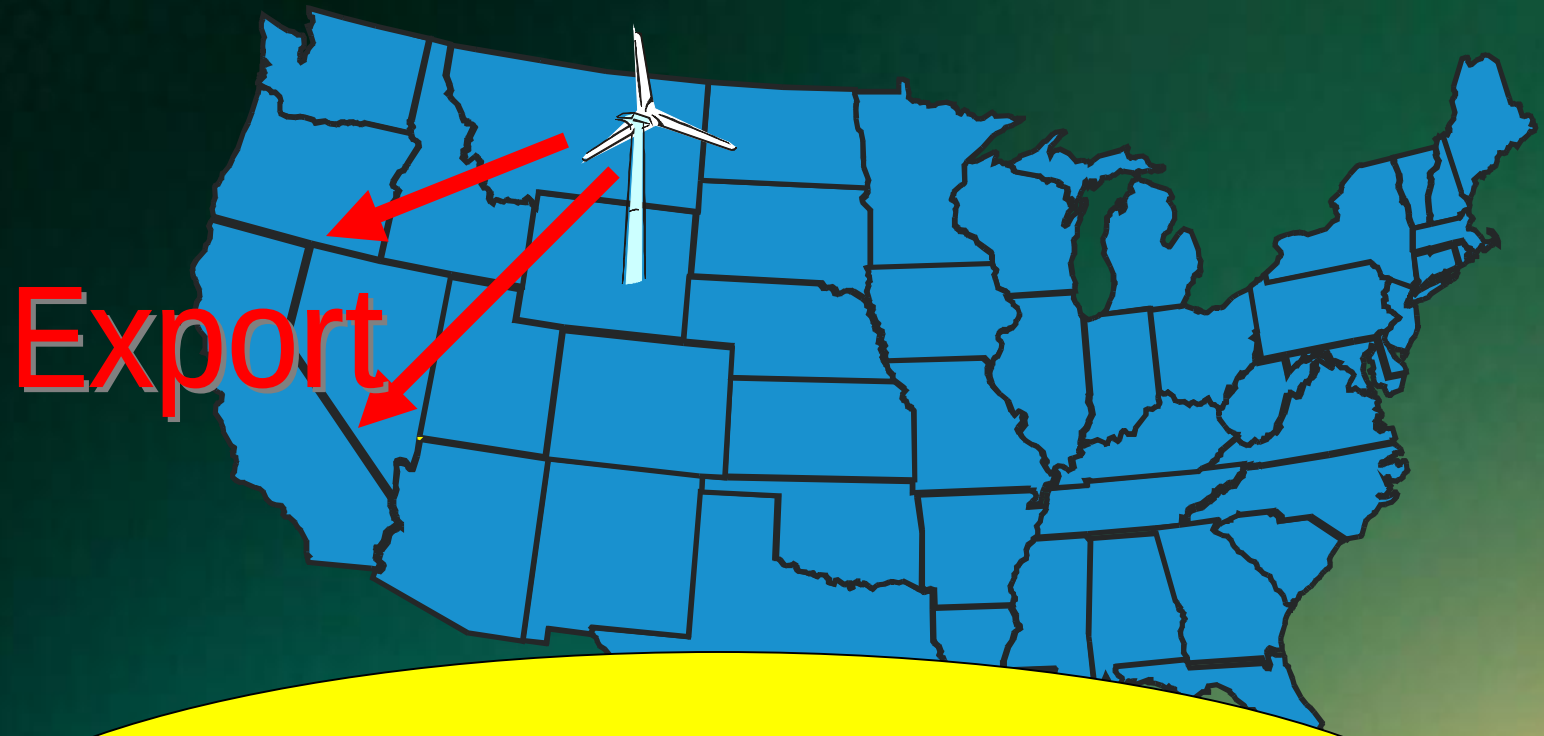
Existing Projects & Contracts

Represent over $250 Million in long term commitment



Montana's Wind Opportunity?

West Coast Markets



To export;

We need "Wires"!

Time for a national grid…